

CLAIMS

1. A method for dehumidifying, drying or the like of different material in a drying chamber (1), **characterized** in that thermal radiation is used concentrated to one or more distinct wavelength ranges at which water has peaks for absorption of radiation energy and that air is circulated in the chamber (1) to take up moisture evaporated from the material.
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2. The method of claim 1, **characterized** in that at least one element (2) is disposed in the drying chamber emitting thermal radiation and that emitted radiation is concentrated to exact wavelength ranges where the water has an absorption coefficient greater than approx. $1,000\text{cm}^{-1}$, while the radiation is reduced in other areas.
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3. The method of claim 1 or 2, **characterized** in that the radiation is concentrated to the wavelength ranges of approx. $6\text{-}7\mu\text{m}$ and approx. $10\text{-}20\mu\text{m}$, while the radiation in the intermediate range, i.e. approx. $7\text{-}10\mu\text{m}$ is reduced.
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4. The method of any of the previous claims, **characterized** in that the prevailing moisture ratio and/or the temperature of the material and/or the chamber (1) is monitored.
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5. The method of claim 4, **characterized** in that the moisture ratio of the material and/or the chamber is monitored by means of one or more indicators (6, 9).
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6. The method of claim 4, **characterized** in that the moisture ratio of the material and/or the chamber is monitored by means of a weighing machine (10), monitoring the total weight of the chamber (1).
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7. The method of any of the preceding claims, **characterized** in that the air of the chamber is circulated by means of a fan (4), an air inlet (16) placed at one end of the chamber (1) and an air outlet (17) placed at an opposite end of the chamber; that the air is recirculated by means of a conduit (3) going from one end of the chamber
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(1) to the opposite end; that a heat exchanger (18) is placed in the conduit (3); that one or more dampers (11) are arranged to let out air from the chamber (1); and/or that a condenser (8) is placed in the chamber (1).

5 8. The method of any of the preceding claims, **characterized** in that the material to be dehumidified etc. is received on a conveyor belt (13) inside the chamber (1).

10 9. The method of any of the claims 1 to 7, **characterized** in that the material to be dehumidified is received on one or more carriages.

15 10. The method of claim 8 or 9, **characterized** in that the thermal radiation is reflected on high-reflective material on the inside of the chamber (1) and on the surface of the conveyor belt (13) or the carriages receiving the material.

11. The method of any of the preceding claims, **characterized** in that it is used for dehumidification and/or sanitation of sewage sludge (7).

20 12. The method of claim 11, **characterized** in that the sewage sludge (7) is kept at a constant temperature in the interval range of 70-120 °C during the humidification cycle.

25 13. The method of claim 11 or 12, **characterized** in that it is used as a part of an ecological system of recycling.

14. The method of any of the claims 1 to 10, **characterized** in that it is used for drying of foodstuffs, such as crispbread or pasta.

30 15. An apparatus for dehumidification, drying or the like in accordance with the method as claimed in any of the preceding claims, **characterized** in that it comprises a drying chamber (1) including at least one element (2) disposed in the drying chamber for emitting thermal radiation; that a fan (4) is provided for the circulation of air in the 35 drying chamber; that indicators (5, 6, 9) are provided for

sensing the temperature and/or moisture ratio of the chamber (1) and/or the material to be dehumidified, dried or the like; and that a control system (PLC system) is provided for controlling the elements (2) and the fan (4) in 5 response to signals received from the indicators (5, 6, 9).

16. The apparatus of claim 15, **characterized** in that the elements (2) are mounted in racks (12) and that the racks (12) have surfaces displaying high reflectance.

17. The apparatus of claim 15 or 16, **characterized** in 10 that the drying chamber (1) is constructed from a chamber which, on the inside, is made of or clad with a material displaying high reflectance; that the drying chamber (1) is provided with an air inlet (16), an air outlet (17), a fan system (4), a conduit (3), including a heat exchanger (18), 15 for recirculation of the air of the chamber (1) and one or more ventilation dampers (14); that indicators (9, 10) are provided for sensing temperature and air humidity in the drying chamber (1); that indicators (27) are provided for sensing the weight of the wood; and that the signals from 20 all indicators (7-10, 27) are fed to a calculation and control device (12).

18. The apparatus of any of the claims 15 to 17, **characterized** in that a conveyor belt (13) and/or a condenser (8) is placed inside the chamber (1).

25 19. The apparatus of any of the claims 15 to 18, **characterized** in that each element (2) comprises an electrical resistor (15) surrounded by a tube (17) or the like and/or that the part surrounding the electrical resistor (15) is made of material having properties to give the de- 30 sired radiation spectrum.